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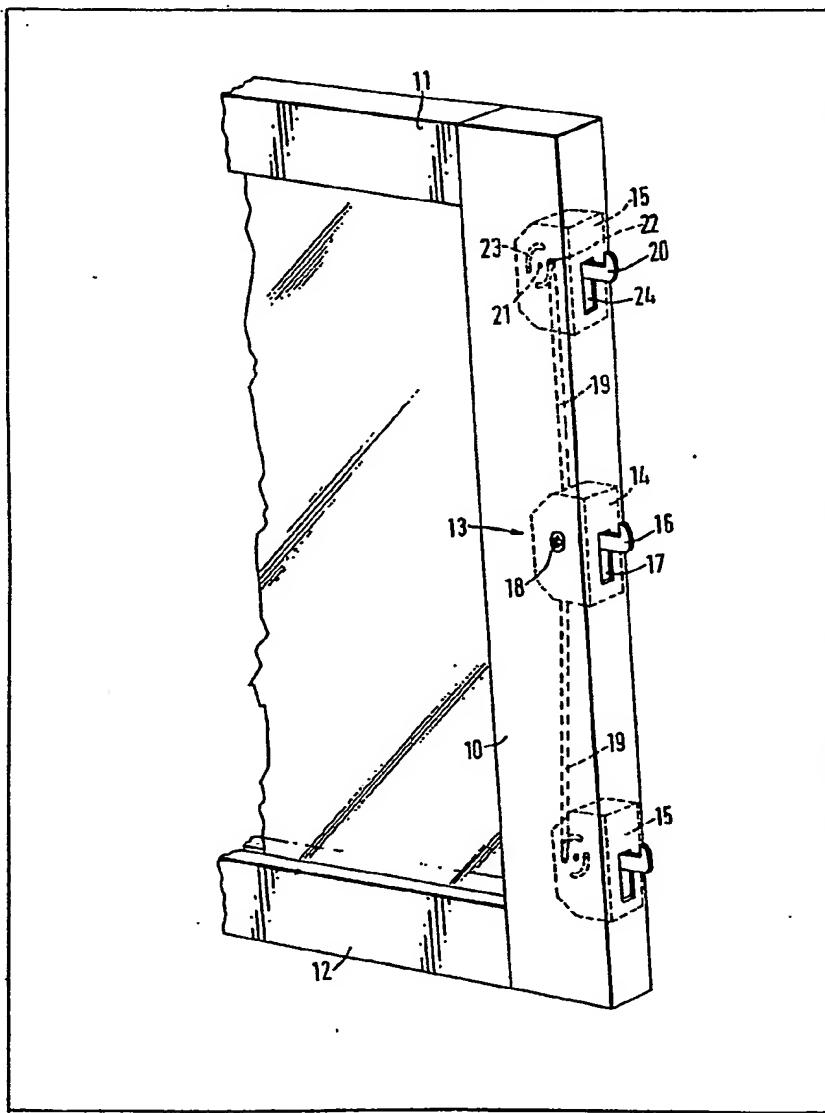
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## (54) Improvements in or relating to hook locks for sliding doors and windows

(57) A hook lock for a sliding door or window comprises three hooked locking members 16, 20 pivotally mounted in longitudinally spaced relation on the locking stile 10 of a door or window in such manner that each member is pivotable between an unlocked position where it lies within the locking stile and a locked position where the hooked portion thereof

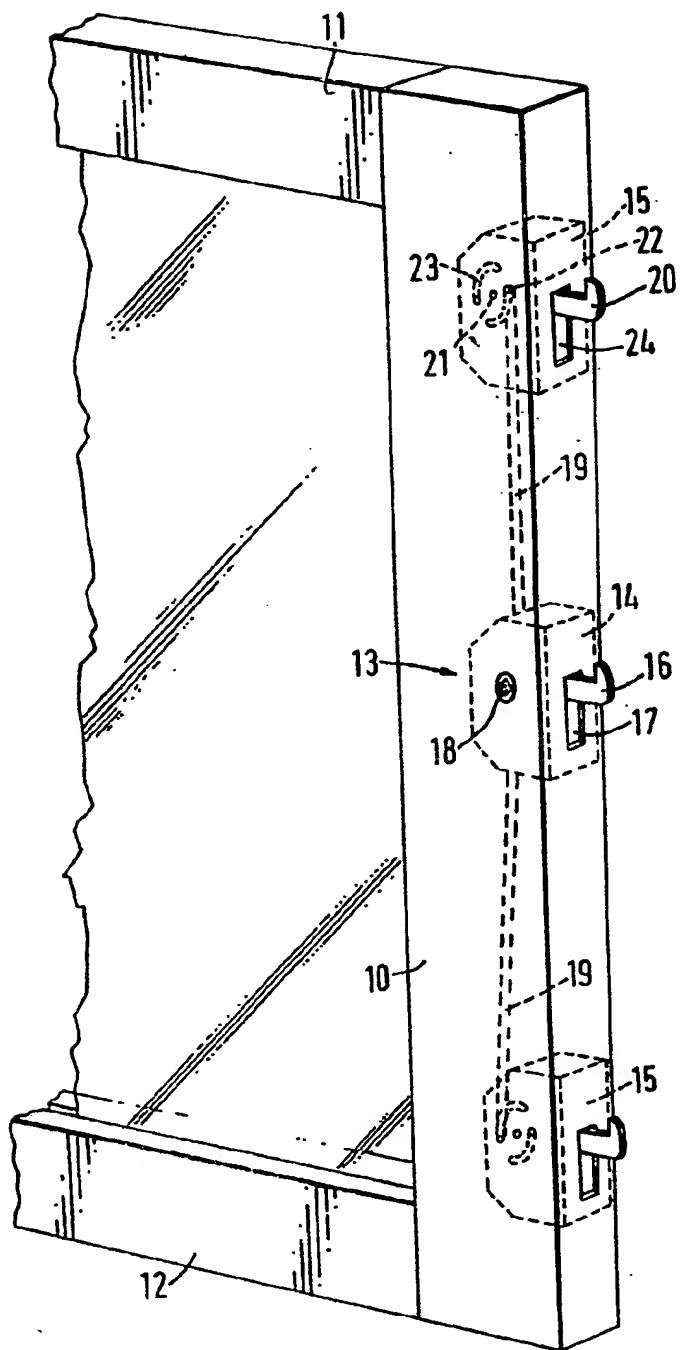
projects from the locking stile. An operating mechanism 18, 19 is provided comprising a shaft 18 for effecting pivotal movement of one locking member 16, which pivotal movement is arranged to effect longitudinal movement of two operating rods 19 which transmit the pivotal movement of said one locking member to the other two locking members 20.

Each bolt 20 carries pins 22 moving in slots 23 in its casing to act as stops. Rods 19 are connected to one of these pins.



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**SPECIFICATION****Improvements in or relating to hook locks for sliding doors and windows**

The invention relates to hook locks for sliding doors and windows. In a conventional hook lock, the lock is mounted in the upright locking stile of the sliding door or window and has a hooked locking member which is arranged to project from the edge face of the stile upon operation of an actuating lever or a key-operated mechanism. The hook is engageable with a keep which is mounted on the fixed upright frame member against which the edge of the locking stile abuts when the door or window is in the closed position.

In the conventional arrangement there is normally provided only a single hooked locking member which is mounted about midway along the locking stile. However, this may not give adequately strong protection against the door or window being forced open. In view of this, therefore, there are available hook locks in which movement of the hooked locking member to the locked position also effects longitudinal movement of two locking bolts which extend upwardly and downwardly respectively from the hook lock, within the locking stile. Operation of the hook lock causes the ends of these bolts to project from the upper and lower ends respectively of the stile and enter vertical bores or keeps in the upper and lower horizontal fixed frame members of the door or window, and thus provide restraint against the door or window being forced open.

However, in practice the use of such a lock may give rise to difficulty in locking the door or window since in order for the lock to be operated the bolts must be in exact registration with the keeps in the fixed frame. Furthermore, doors or windows of a type which incorporate this kind of lock are often supplied in the form of a kit which the user assembles, cutting the component to size if necessary according to the size of the door or window aperture which is to be fitted. If the vertical height of the door or window has to be adjusted it is necessary to cut the locking stile to length by removal of a portion from one end thereof. Where the stile incorporates a hook lock of the kind described, therefore, it is necessary also to cut one of the bolts to length and this may be difficult or inconvenient.

The present invention sets out to provide an improved form of hook lock for a sliding door or window wherein additional strength is provided to resist forcing open of the door or window and yet where the above-mentioned disadvantages are avoided.

According to the invention there is provided a hook lock for a sliding door or window comprising two or more hooked locking members having means for movably mounting them in longitudinally spaced relation on the locking stile of a door or window in such manner that each member is movable between an unlocked position where it lies substantially within the locking stile and a locked position where the hooked portion

thereof projects from the locking stile, and operating means for effecting movement of said locking members simultaneously between their locked and unlocked positions. Preferably there are provided three hooked locking members spaced longitudinally of the stile. Preferably means are provided for pivotally mounting the locking members on the stile, said operating means being arranged to effect swinging movement of the locking members about their pivot axes. The pivot axes of the locking members are preferably parallel. Stop means may be provided to limit the movement of each locking member between its locked and unlocked positions. For example the stop means may comprise a pin-and-slot assembly, one part of the assembly being movable with the locking member and the other part being fixed. In the case where each locking member is pivotally mounted, the slot may be an arcuate slot extending around the pivot axis of the locking member. Also in the case where each locking member is pivotally mounted, the operating means may include an operating element movable longitudinally of the stile and engageable with a part of at least one locking member spaced from the pivot axis thereof, whereby longitudinal movement of the element effects pivoting movement of the locking member.

The operating means may comprise means for effecting pivotal movement of one locking member, which pivotal movement is arranged to effect longitudinal movement of said operating element so as to transmit the pivotal movement of said one locking member to the locking member engaged by the operating element. The operating element may comprise a rod extending longitudinally of the stile and coupled to said one locking member so that pivotal movement of said one locking member effects longitudinal movement of the rod and hence pivotal movement of the other locking member. In the case where there are provided three locking members, said one locking member may be a middle member and may be connected with the other two locking members by two operating elements extending in opposite directions therefrom longitudinally of the stile. The means for effecting pivotal movement of said one locking member may comprise a pivotable lever or key-operated mechanism coupled to the locking member.

The invention includes within its scope a door or window stile fitted with a hook lock according to the invention, and also a door or window incorporating such a stile. The following is a detailed description, by way of example, of an embodiment of the invention, reference being made to the accompanying drawing which is a diagrammatic perspective view of the vertical locking stile of a sliding door fitted with a hook lock.

The frame of the door comprises a hollow section vertical locking stile 10 connected by

upper and lower horizontal frame members 11 and 12 to a further vertical stile (not shown). The frame members may be formed from extruded aluminium.

5 The horizontal members of the sliding door are engageable and slidable within horizontal upper and lower fixed framed members (not shown) and the locking stile 10 co-operates, when the door is closed, with a fixed vertical frame member (also not shown).

A hook lock, indicated generally at 13, is located within the locking stile 10 and comprises a central main lock assembly 14 and upper and lower auxiliary assemblies 15.

15 The central main assembly 14 comprises a hook-shaped locking member 16 which is pivotally mounted within the casing of the assembly 14 so that it may be swung into and out of the assembly 14 through an aperture 17 in the 20 side edge face of the locking stile 10. Pivotal movement of the locking member 6 is effected by rotation of a shaft 18 in the assembly 14, by means of a manually operable pivotable lever (not shown).

25 The shaft 18 and hooked locking member 16 are coupled by known means (not shown) to the ends of connecting rods 19 which extend in opposite directions longitudinally of the stile 10 from the assembly 14 and are coupled to the 30 auxiliary assemblies 15 respectively.

Each auxiliary locking assembly 15 comprises a hooked locking member 20 which is pivotally mounted within the assembly as indicated at 21 and carries drive pins 22 which co-operate with 35 arcuate slots 23 respectively in the casing of the assembly 15.

The end of each rod 19 is connected to one of the drive pins 22 of its associated locking assembly.

40 The arrangement is such that when the shaft 18 is turned to cause the central locking member 16 to project from the stile, as shown in the drawing, the two rods 19 are moved longitudinally outwardly from the assembly 14 and effect 45 rotation of the locking members 20 so that they also are swung to project from the surface of the stile, passing through apertures 24 therein.

The fixed vertical frame member with which the locking stile co-operates is formed with three 50 vertically spaced keeps which are engaged by the locking members 16 and 20 respectively so as to retain the door securely in the locked position. The keeps may be of any convenient form and one suitable form of keep is disclosed in our co-pending Application No. 8214488.

55 Preferably the two outer hook lock assemblies 15 are spaced from the ends of the stile 10 by a sufficient distance to enable the stile to be cut to any size within a conventional range for sliding doors so that the stile may be cut to size without interfering with the hook lock.

60 Preferably the connection between the shaft 18 and the hook lock member 16 incorporates a lost-motion device, so that the members 16 and 20 65 are effectively deadlocked when in engagement

with their associated keeps.

Although the arrangement shows three spaced hooked locking members, it will be appreciated that any convenient number may be employed 70 provided that the members are interconnected so as to be operable simultaneously by operation of a single operating device.

A known form of key-operated locking device 75 may be associated with the assembly 14 so that the lever and shaft 18 cannot be turned until the key-operated device has been unlocked.

#### CLAIMS

1. A hook lock for a sliding door or window comprising two or more hooked locking members 80 having means for movably mounting them in longitudinally spaced relation on the locking stile of a door or window in such a manner that each member is movable between an unlocked position where it lies substantially within the locking stile 85 and a locked position where the hooked portion thereof projects from the locking stile, and operating means for effecting movement of said locking members simultaneously between their locked and unlocked positions.

- 90 2. A hook lock according to claim 1, wherein there are provided three hooked locking members which, in use, are spaced longitudinally of the stile.

- 95 3. A hook lock according to claim 1 or claim 2, wherein means are provided for pivotally mounting the locking members on the stile, said operating means being arranged to effect swinging movement of the locking members about their pivot axes.

- 100 4. A hook lock according to claim 3, wherein the pivot axes of the locking members are parallel.

5. A hook lock according to any of claims 1 to 4, wherein stop means are provided to limit the movement of each locking member between its locked and unlocked positions.

- 105 6. A hook lock according to claim 5, wherein the stop means comprise a pin-and-slot assembly, one part of the assembly being movable with the locking member and the other part being fixed.

- 110 7. A hook lock according to any of claims 1 to 6, wherein each locking member is pivotally mounted, and the slot is an arcuate slot extending around the pivot axis of the locking member.

8. A hook lock according to any of claims 1 to 115 7, wherein each locking member is pivotally mounted, and the operating means include an operating element movable longitudinally of the stile and engageable with a part of at least one locking member spaced from the pivot axis

- 120 thereof, whereby longitudinal movement of the element effects pivoting movement of the locking member.

- 125 9. A hook lock according to claim 8, wherein the operating means comprise means for effecting pivotal movement of one locking member, which pivotal movement is arranged to effect longitudinal movement of said operating element so as to transmit the pivotal movement of said one locking member to the locking member engaged

by the operating element.

10. A hook lock according to claim 9, wherein the operating element comprises a rod extending longitudinally of the stile and coupled to said one locking member so that pivotal movement of said one locking member effects longitudinal movement of the rod and hence pivotal movement of the other locking member.

11. A hook lock according to any of claims 8 to 10, wherein there are provided three locking members, and wherein said one locking member is a middle member and is connected with the other two locking members by two operating elements extending in opposite directions

15 therefrom longitudinally of the stile.

12. A hook lock according to any of claims 8 to 11, wherein the means for effecting pivotal movement of said one locking member comprises a pivotable lever or key-operated mechanism

20 coupled to the locking member.

13. A hook lock substantially as hereinbefore described with reference to the accompanying drawing.

14. A door or window stile fitted with a hook lock according to any of the preceding claims.

25 15. A door or window incorporating a stile fitted with a hook lock according to any of claims 1 to 13.